Science Toolkit: Grade 5 Objective 1.B.1.a

Student Handout: Science: Grade 5 Objective 1.B.1.a

Standard 1.0 Skills and Processes

Topic B. Applying Evidence and Reasoning

Indicator 1. Seek better reasons for believing something than "Everybody knows that..." or "I just know" and discount such reasons when given by others.

Objective a. Develop explanations using knowledge possessed and evidence from observations, reliable print resources, and investigations.

Selected Response (SR) Item

Question

Use the passage 'A New Glue ... from Inside Cow Bellies?' to answer the following question.

Based on Dr. Weimer's data, bacteria might be a good source for wood glue because the bacteria

A. are easy to grow
B. stick tightly to each other
C. stick tightly to plant materials
D. can easily be taken from cow stomachs

Correct Answer

C. stick tightly to plant materials

Question

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Handouts

A New Glue ... from Inside Cow Bellies?

If you take a drive through the country, you might see a herd of cows munching on grass and shrubs. Unlike us, they can eat and digest tough, fibrous plants. They can do this, in part, because of bacteria that live in their bellies.

Those bacteria, like some that live in your own stomach, are very helpful. They feed on chewed-up food once it makes its way down into the cow's gut. This helps grind the plant chunks into even smaller pieces so the cows can get the most nutrients from their food.

Paul Weimer studies these bacteria. He's a microbiologist with the Agricultural Research Service in Madison, Wisconsin.

One day Dr. Weimer was watching some bacteria under a microscope. They were turning plant chunks into food for themselves and the cow in which they lived. He was impressed with how tightly the bacteria stuck to the plant material, and that gave him an interesting idea: "If the bacteria are so good at sticking to plant materials, wouldn't they be good at sticking to other similar things, like wood? Could they be used to make a wood glue?"

Do you know why these little bacteria are so good at attaching themselves to things?

Dr. Weimer explains, "They have an outer slime layer that allows them to cling to a surface. In my laboratory, they stick so tightly to plant material, or cellulose, I can't get them off without destroying them."

Other bacteria are good clingers too. Some can stick to our teeth and cause cavities if we don't brush them off. Eeeww!

It might sound really weird to you, but finding bacteria that can form a glue is a great discovery. It could help replace some of the smelly and expensive chemicals that are used right now to make wood products. That could help the environment.

"A New Glue … from Inside Cow Bellies?" Courtesy: United States Department of Agriculture.